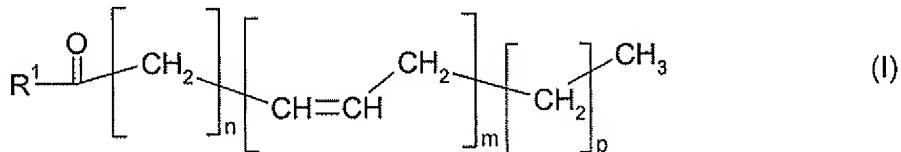


AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently amended) A process for production of compounds of the general formula I

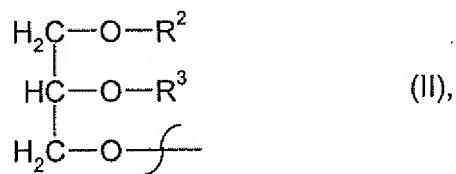


in a transgenic organism[[s]] with a content of at least 1% by weight of these compounds based on the total lipid content of the transgenic organism, which comprises the following process steps:

- a) introducing, into the an organism, at least one nucleic acid sequence which encodes an ω -3-desaturase activity that is capable of desaturating C20- or C22-fatty acids, and
- b) culturing the organism under conditions which permits the production of compounds of the general formula I, and

where the variables and substituents in formula I have the following meanings:

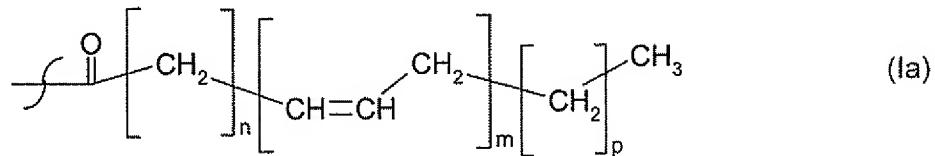
R¹ = hydroxyl, coenzyme A (thioester), lysophosphatidylcholine, lysophosphatidylethanolamine, lysophosphatidylglycerol, lyso-diphosphatidylglycerol, lysophosphatidylserine, lysophosphatidylinositol, sphingo base or a radical of the formula II



R² = hydrogen, lysophosphatidylcholine, lysophosphatidylethanolamine, lysophosphatidylglycerol, lysodiphosphatidylglycerol, lysophosphatidylserine, lysophosphatidylinositol or saturated or unsaturated C₂-C₂₄-alkylcarbonyl,

R³ = hydrogen, saturated or unsaturated C₂-C₂₄-alkylcarbonyl, or R² and R³

independently of one another are a radical of the formula Ia:



$n = 2, 3, 4, 5, 6, 7$ or $9, m = 2, 3, 4, 5$ or 6 and $p = 0$ or 3 .

2. (Original) The process according to claim 1, wherein in addition to the nucleic acid sequence introduced in item a), which codes for an ω -3-desaturase activity, further nucleic acid sequences which code for polypeptides with $\Delta 9$ -elongase, $\Delta 6$ -desaturase, $\Delta 8$ -desaturase, $\Delta 6$ -elongase, $\Delta 5$ -desaturase, $\Delta 5$ -elongase or $\Delta 4$ -desaturase activity are introduced.

3. (Previously presented) The process according to claim 1, wherein the substituents R^2 or R^3 independently of one another are saturated or unsaturated C_{18} - C_{22} -alkylcarbonyl.

4. (Previously presented) The process according to claim 1, wherein the substituents R^2 or R^3 independently of one another are unsaturated C_{18} -, C_{20} - or C_{22} -alkylcarbonyl with at least two double bonds.

5. (Previously presented) The process according to claim 1, wherein the transgenic organism is a transgenic microorganism or a transgenic plant.

6. (Currently amended) The process according to claim 1, wherein the transgenic organism is an oil-producing plant, a vegetable producing plant, or an ornamental plant.

7. (Previously presented) The process according to claim 1, wherein the transgenic organism is a transgenic plant selected from the group of the plant families Adelotheciaceae, Anacardiaceae, Asteraceae, Apiaceae, Betulaceae, Boraginaceae, Brassicaceae, Bromeliaceae, Caricaceae, Cannabaceae, Convolvulaceae, Chenopodiaceae, Crypthecodiniaceae, Cucurbitaceae, Ditrichaceae, Elaeagnaceae, Ericaceae, Euphorbiaceae, Fabaceae, Geraniaceae, Gramineae, Juglandaceae, Lauraceae, Leguminosae, Linaceae or Prasinophyceae.

8. (Previously presented) The process according to claim 1, wherein the compounds of the general formula I are isolated from the organism in the form of their oils, lipids or free fatty acids.

9. (Previously presented) The process according to claim 1, wherein the compounds of the general formula I are isolated in a concentration of at least 5% by weight based on the total lipid content of the transgenic organism.

10-13. (Cancelled)

14. (Withdrawn, currently amended) An isolated nucleic acid sequence which codes for encoding a polypeptide[[s]] with ω-3-desaturase activity that is capable of desaturating C20- or C22-fatty acids, wherein the isolated nucleic acid sequence is selected from the group consisting of:

- a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 1,
- b) ~~a nucleic acid sequence[[s]] which, as the result of the degeneracy of the genetic code, can be derived from encodes~~ the amino acid sequence shown in SEQ ID NO: 2, or and
- c) ~~derivatives of the a nucleic acid sequence shown in SEQ ID NO: 1 which encodes a polypeptide[[s]] with at least 60% identity at the amino acid level with SEQ ID NO: 2, and which have wherein the polypeptide has ω-3-desaturase activity and is capable of desaturating C20- or C22-fatty acids.~~

15. (Withdrawn) The isolated nucleic acid sequence according to claim 14, wherein the sequence is derived from an alga, a fungus, a microorganism or a nonhuman animal.

16. (Withdrawn) The isolated nucleic acid sequence according to claim 14, wherein the sequence is derived from the family Pythiaceae.

17. (Withdrawn, currently amended) An amino acid sequence which is encoded by the isolated nucleic acid sequence according to claim 14, wherein the amino acid sequence has ω-3-desaturase activity and is capable of desaturating C20- or C22-fatty acids.

18. (Withdrawn) A gene construct comprising the isolated nucleic acid according to claim 14, wherein the nucleic acid is linked functionally to one or more regulatory signals.

19. (Withdrawn) The gene construct according to claim 18, wherein the nucleic acid construct comprises additional biosynthesis genes of the fatty acid or lipid metabolism selected from the group acyl-CoA dehydrogenase(s), acyl-ACP [= acyl carrier protein] desaturase(s),

acyl-ACP thioesterase(s), fatty acid acyltransferase(s), acyl-CoA:lysophospholipid acyltransferase(s), fatty acid synthase(s), fatty acid hydroxylase(s), acetyl-coenzyme A carboxylase(s), acyl-coenzyme A oxidase(s), fatty acid desaturase(s), fatty acid acetylenases, lipoxygenases, triacylglycerol lipases, allenoxide synthases, hydroperoxide lyases or fatty acid elongase(s).

20. (Withdrawn) The gene construct according to claim 18 wherein the nucleic acid construct additionally comprises biosynthesis genes of the fatty acid or lipid metabolism selected from the group Δ4-desaturase, Δ5-desaturase, Δ6-desaturase, Δ8-desaturase, Δ9-desaturase, Δ12-desaturase, Δ6-elongase, Δ5-elongase or Δ9-elongase.

21. (Withdrawn) A vector comprising the nucleic acid according to claim 14.

22. (Withdrawn) A transgenic nonhuman organism comprising at least one nucleic acid according to claim 14.

23. (Withdrawn) The transgenic nonhuman organism according to claim 22, wherein the organism is a microorganism, a nonhuman animal or a plant.

24. (Withdrawn) The transgenic nonhuman organism according to claim 22, wherein the organism is a plant.

25. (New) The process according to claim 1, wherein the ω-3-desaturase is capable of desaturating C20-fatty acids.

26. (New) The process according to claim 1, wherein the ω-3-desaturase is capable of desaturating C18-, C20- and C22-fatty acid.